

CLAIMS

- WAI
1. Electrical impedance tomography apparatus adapted to detect abnormalities in bodily matter comprising:
 - electrical signal generating means for generating electrical signals at a plurality of frequencies;
 - an electrode arrangement for applying the electrical signals to the bodily matter and detecting electrical impedance properties of the bodily matter; and
 - data processing means for correlating the detected electrical impedance properties with the presence or absence of abnormalities in the bodily matter;
 - in which electrical signals of a frequency greater than 1 MHz, preferably greater than 2 MHz, more preferably greater than 3 MHz and most preferably greater than 4 MHz are applied to the bodily matter.
 2. Apparatus according to claim 1 adapted to detect a carcinoma.
 3. Apparatus according to claim 2 adapted to detect a breast carcinoma.
 4. Apparatus according to claim 2 or claim 3 adapted to detect a stage 3 carcinoma.
 5. Apparatus according to any of claims 2 to 4 adapted to detect a stage 2 carcinoma.

6. Apparatus according to any of claims 2 to 5 adapted to detect a stage 1 carcinoma.
7. Apparatus according to any previous claims in which the data processing means correlates the detected electrical impedance properties with the presence or absence of abnormalities using a fractal model of tissue impedance.
8. Apparatus according to any previous claim in which information related to dispersion frequencies is used to perform the correlation.
9. Apparatus according to any previous claims in which the ratio of intra cellular impedance and extra cellular impedance is used to perform the correlation.
10. Apparatus according to any previous claims in which the data processing means references the detected electrical impedance properties of the bodily matter to the detected electrical impedance properties of other bodily matter.
11. Apparatus according to claim 10 when dependent on claim 3 in which the impedance properties are referenced to detected electrical impedance properties of fatty tissue in the breast.
12. Apparatus according to previous claim in which the data processing means is adapted to compare the detected electrical impedance properties with a database of impedance properties corresponding to bodily matter of known compositions.
13. Apparatus according to claim 12 in which the database comprises impedance properties of bodily matter obtained from subjects of differing and known ages.

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14. Apparatus according to any previous claims in which at least the electrode arrangement is disposed in a women's brassiere.

15. An electrical tomographic method for detecting abnormalities in bodily matter comprising the steps of:

generating electrical signals at a plurality of frequencies;

applying said electrical signals to the bodily matter;

detecting electrical impedance properties of the bodily matter; and

correlating the detected impedance properties with the presence or absence of abnormalities in the bodily matter;

in which electrical signals of a frequency greater than 1 MHz, preferably greater than 2 MHz, more preferably greater than 3 MHz and most preferably greater than 4 MHz are applied to the bodily matter.

16. A method according to claim 15 in which the abnormality is a carcinoma.

17. A method according to claim 16 in which the abnormality is a breast carcinoma.

18. A method according to claim 16 or claim 17 in which a stage 3 carcinoma is detected.

19. A method according to any of claim 16 to 18 in which a stage 2 carcinoma is detected.
20. A method according to any of claims 16 to 19 in which a stage 1 carcinoma is detected.
21. A method according to any of claims 15 to 20 in which the correlation of the detected impedance properties with the presence or absence of abnormalities uses a fractal model of tissue impedance.
22. A method according to any of claims 15 to 21 in which information related to dispersion frequencies is used to perform the correlation.
23. A method according to any of claims 15 to 22 in which the ratio of intra-cellular impedance and extra-cellular impedance is used to perform the correlation.
24. A method according to any of claims 15 to 23 in which the detected electrical impedance properties of the bodily matter are referenced to detected electrical impedance properties of other bodily matter.
25. A method according to claim 24 when dependent on claim 17 in which the impedance properties are referenced to detected electrical impedance properties of fatty tissue in the breast.
26. A method according to any of claim 15 to 25 in which the detected electrical impedance properties are compared with a database of impedance properties corresponding to bodily matter of known composition.

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27. A method according to claim 26 in which the database comprises impedance properties of bodily matter obtained from subject of differing and known ages.
28. A method according to any of claims 24 to 27 in which the detected electrical impedance properties of the bodily matter are referenced or compared to impedance properties of other bodily matter of a controlled temperature.